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08/11/2006

Takashi Akiyama

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12/10/2010

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EXAMINER

MOON, SEOKYUN

ART UNIT

PAPER NUMBER

2629

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12/10/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,355	Applicant(s) AKIYAMA, TAKASHI	
	Examiner SEOKYUN MOON	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/03/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Previously Presented Claims

1. Claims 1, 3, 4, 6, and 7 were rejected under 35 U.S.C. 103(a) as being unpatentable over JP Publication No. 2002-289374 by Yamazaki et al. (herein after "Yamazaki") in view of U.S. Patent No. 5,793,163 by Okuda.

Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Okuda, and further in view of the Applicant's Admitted Prior Art (herein after "AAPA").

Claims 8-19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Okuda, and further in view of U.S. Publication No. 2004/0017342 by Sekine.

Response to Arguments

2. The Applicant's arguments filed September 17, 2010 have been fully considered.

Regarding the rejection of claim 1, the Applicant argues, "The Office action correctly... and, instead, relies on Okuda (page 3 of Office Action), apparently asserting that Figure 10 of Okuda teaches this element. This is incorrect." [Remarks: pg 9 1st full paragraph]. Specifically, the Applicant argues that since Okuda teaches the constant current supply 3 being directly connected to the lighting element 2, the constant current supply 3 of Okuda supplies current directly to lighting element 2, not for charging the charging section via the constant current circuit [Remarks: pg 9 2nd full paragraph and the last partial paragraph lines 1-6].

Examiner respectfully disagrees.

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Examiner respectfully submits that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It appears that the Applicant's above argument is based on that Okuda does not teach the claim limitation. However, the rejection of claim 1 was based on applying the teaching of Okuda to the circuit of Yamazaki. **Yamazaki teaches the concept of charging the charging section via a power supply section.** What Yamazaki does not teach is that the power supply section includes the constant current circuit. By including the constant current circuit in the power supply section of Yamazaki based on the teaching of Okuda, Yamazaki as modified by Okuda teaches the concept of charging the charging section via the power supply section which includes the constant current circuit. Accordingly, Examiner respectfully submits that the combination of the cited prior arts teaches the claim limitation.

Regarding the rejection of claim 1, the Applicant further argues, "Even if Okuda were to be modified to establish another connection, however, such a modification would impermissibly change the principle of operation described in some detail in column 1 lines 20-26 of Okuda." [Remarks: pg 9 the last five lines of the page].

Examiner respectfully disagrees.

The basis of the previous rejection of claim 1 is not modifying the circuit structure of Okuda, but is modifying the power supply section of Yamazaki based on the teaching of Okuda. Thus, the Applicant's above argument regarding changing the principle operation of Okuda is not persuasive. Furthermore, Examiner respectfully submits that including a constant current circuit

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in the power supply section of Yamazaki would not change the principle operation of the circuit of Yamazaki.

Regarding the rejection of claim 1, the Applicant further argues, "Even if this is correct, which the Applicant does not concede, Okuda would still fail to teach the claimed element. Okuda simply teaches nothing at all about a charging section, much less the claimed "a constant current circuit for charging section via said constant current circuit" (emphasis added), as recited in claim 1 [Remarks: pg 10 1st full paragraph].

As explained with respect to the Applicant's first argument [page 3 of this Office action], Examiner respectfully submits that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As explained above, **the combination** of the cited prior arts teaches the claim limitation.

The Applicant further argues, "Moreover, the Office Action has provided no motivation for one of ordinary skill in the art to modify the teachings of the prior art to achieve the claimed combinations." [Remarks: pg 11 the 1st full paragraph].

However, page 4 of the previous Office action very clearly discloses the motivation to apply the teaching of Okuda to the circuit of Yamazaki.

Lastly, the Applicant argues that the advantage or the use of the power supply section of the instant invention is not taught by the cited prior art [Remarks: pg 11 the last paragraph].

However, Examiner respectfully submits that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the

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prior art in order to patentably distinguish the claimed invention from the prior art. In this case, Examiner respectfully submits that such use of the power supply section of the instant invention does not result in the structure difference between the claimed invention and the prior arts.

Information Disclosure Statement

3. The information disclosure statement (IDS) filed on November 3, 2010 has been acknowledged and considered by Examiner. A copy of the form PTO-1449 is included in this correspondence.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 3, 4, 6, and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Okuda.

As to **claim 1**, Yamazaki teaches a light source driving circuit [drawing 1 and pg 2, the description of the drawing 1] comprising:

a light source section [drawing 1, "103"];

a charge section [drawing 1, "104"];

a power supply section [drawing 1, "101"] for charging the charging section;

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a switching section [drawing 1, “102”] for connecting the charging section (“104”) to the power supply section (“101”) or to the light source section (“103”); and

a control section [drawing 1, “105”] for controlling the switching section (“102”) so as to connect the charging section (“104”) to the power supply section (“101”), thereby charging the charging section, and so as to disconnect the charging section from the power supply section and connect the charging section to the light source section (“103”), thereby causing the light source section to emit light [pg 11 par. (0023) and par. (0024)].

Yamazaki teaches that the power supply section includes a voltage source [drawing 1, “101”), but does not teach that the power supply section includes a constant-current circuit.

However, Okuda teaches the concept of serially connecting a constant-current circuit [fig. 10, “3”) to a voltage source [fig. 10, “1”), to provide power to a light source section [fig. 10, “2”).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light source driving circuit of Yamazaki to serially connect a constant-current circuit to the voltage source such that the combination of the voltage source and the constant-current circuit provides power to the light source section, as taught by Okuda, in order to change the driving current supplied to the light source section into a constant current [Okuda: col. 1 lines 19-23] and thus to stabilize the operation of the light source driving circuit.

Yamazaki as modified by Okuda teaches that the charging section is charged via the constant-current circuit because, in the modified light source driving circuit of Yamazaki, a constant-current circuit is placed between the light source section [Yamazaki: drawing 1, “103”) and the voltage source [Yamazaki: drawing 1, “101”).

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As to **claim 3**, Yamazaki as modified by Okuda teaches that the switching section [Yamazaki: drawing 1, "102"] includes a first switch [Yamazaki: drawing 2, "201"] and a second switch [Yamazaki: drawing 2, "202"], wherein the power supply section [Yamazaki: drawing 1, "101"] is connected to the charging section [Yamazaki: drawing 1, "104"] via the first switch and the light source section [Yamazaki: drawing 1, "103"] is connected to the charging section via the second switch.

As to **claim 4**, Yamazaki as modified by Okuda teaches that the first switch [Yamazaki: drawing 2, "201"] and the second switch [Yamazaki: drawing 2, "202"] each have a control terminal (the gates of "201" and "202") and the first switch and the second switch are controlled so as to conduct cyclically and in an alternating drive by a control signal [Yamazaki: drawings 1 and 2, the signal applied to the node "S"] that the control section [Yamazaki: drawing 1, "105"] applies to the each control terminal [Yamazaki: pg 10 par. (0020) lines 11-14].

As to **claim 6**, Yamazaki as modified by Okuda teaches that the charging section [Yamazaki: drawing 1, "104"] includes a driving capacitor [Yamazaki: pg 10 par. (0020) line 8].

As to **claim 7**, Yamazaki as modified by Okuda teaches that the light source section [Yamazaki: drawing 1, "103"] includes a light-emitting diode [Yamazaki: pg 10 par. (0020) lines 14-17].

6. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Okuda as applied to claims 1, 3, 4, 6, and 7 above, and further in view of AAPA.

Yamazaki as modified by Okuda teaches that a non-emitting period [Yamazaki: drawing 1 and pg 10 par. (0020) lines 11-14, the period during which the power supply section "105" outputs the signal having the state of L] which includes a period during which the charging

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section is connected to the power supply section for charging is set equal to an emitting period [Yamazaki: drawing 1 and pg 10 par. (0020) lines 11-14, the period during which the power supply section “105” outputs the signal having the state of H] during which the light source section is caused to emit light.

Yamazaki as modified by Okuda does not teach that the non-emitting period is set longer than the emitting period.

However, AAPA teaches a light source driving circuit [fig. 14a] and the concept of setting the non-emitting period of the light source driving circuit to be longer than the emitting period of the light source driving circuit [fig. 14b].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light source driving circuit of Yamazaki as modified by Okuda to set the non-emitting period of the light source driving circuit to be longer than the emitting period of the light source driving circuit, as taught by AAPA, in order to provide sufficient time for charging the charging section of the light source driving circuit.

7. **Claims 8-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Okuda as applied to claims 1, 3, 4, 6, and 7 above, and further in view of Sekine.

As to **claim 8**, Yamazaki as modified by Okuda teaches that the light source section includes a single light source [Yamazaki: drawing 1, “103”].

Yamazaki as modified by Okuda does not teach that the light source section includes a plurality of light sources.

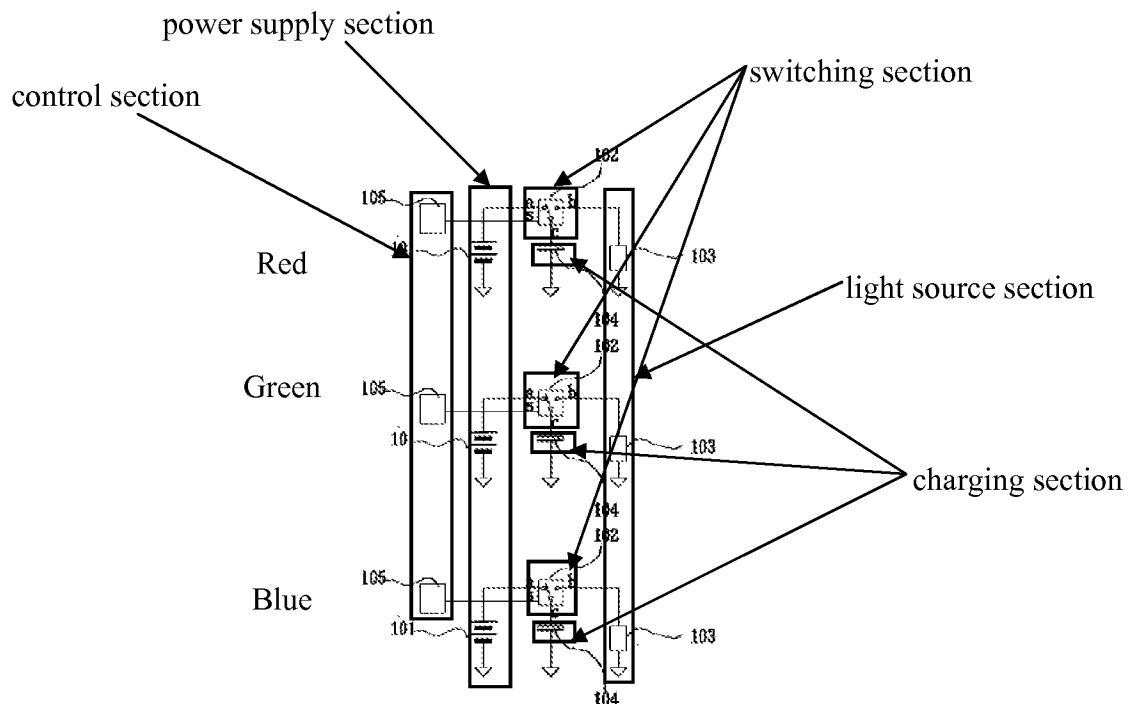
However, Sekine teaches the concept of using three light sources [figs. 1 and 5, “RLED”, “GLED”, and “BLED”] for emitting different color lights (i.e. red, green, and blue) as

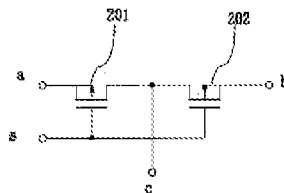
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a backlight for a display, wherein the three light sources are activated sequentially to emit the different color lights sequentially [par. (0055)].

Since the light source driving circuit of Yamazaki as modified by Okuda is also used as a backlight for a display [Yamazaki: pg 7 par. (0002)], it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light source section of Yamazaki as modified by Okuda to include three light sources emitting different color lights (i.e. red, green, and blue) and a light source driving circuit for each of the light sources and to activate the three light sources sequentially, in order to provide a field sequential driving type color display which does not require color filters and thus to improve the color quality of the display.

Drawing 1 provided below shows the light source driving circuit of Yamazaki as modified above. Drawing 2 of Yamazaki is reproduced below for the Applicant's convenience. Please note that the drawing 2 is a detailed structure of the element "102" shown on drawing 1.



Drawing 1Drawing 2

As to **claim 9**, Yamazaki as modified by Okuda and Sekine teaches that the switching section includes a first switch [drawings 1 and 2 above, “201” for red light source driving circuit], a second switch [drawings 1 and 2 above, “202” for red light source driving circuit], a third switch [drawings 1 and 2 above, “202” for green light source driving circuit], and a fourth switch [drawings 1 and 2 above, “202” for blue light source driving circuit] and the power supply section [drawing 1 above] is connected to the charging section [drawing 1 above] via the first switch, the first light source [drawing 1 above, “103” for red light source driving circuit] is connected to the charging section via the second switch, the second light source [drawing 1 above, “103” for green light source driving circuit] is connected to the charging section via the third switch, and the third light source [drawing 1 above, “103” for blue light source driving circuit] is connected to the charging section via the fourth switch.

As to **claim 10**, Yamazaki as modified by Okuda and Sekine teaches that the first switch [drawings 1 and 2 above, “201” for red light source driving circuit], the second switch [drawings 1 and 2 above, “202” for red light source driving circuit], the third switch [drawings 1 and 2 above, “202” for green light source driving circuit], and the fourth switch [drawings 1 and 2 above, “202” for blue light source driving circuit] each have a control terminal (the gate of

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“202”) and the first switch, the second switch, the third switch, and the fourth switch are controlled so as to conduct cyclically and in an alternating drive by a control signal that the control section applies to the each control terminal [Sekine: fig. 5] (Note that Yamazaki teaches the concept of activating the light source section by supplying the control signal to the switching section and Sekine teaches the concept of activating a plurality of light source sections sequentially. Thus, Yamazaki as modified by Sekine teaches the concept of activating the plurality of light source sections sequentially by supplying the control signal to the switching sections sequentially.).

As to **claim 11**, Yamazaki as modified by Okuda and Sekine teaches that the power supply section includes a constant-current circuit, and wherein the power supply section charges the charging section via the constant-current circuit, as discussed with respect to the rejection of claim 1.

As to **claim 12**, Yamazaki as modified by Okuda teaches that the light source section includes a single light source [Yamazaki: drawing 1, “103”].

Yamazaki as modified by Okuda does not teach that the light source section includes a plurality of light sources.

However, Sekine teaches the concept of using three light sources [figs. 1 and 5, “RLED”, “GLED”, and “BLED”] for emitting different color lights (i.e. red, green, and blue) as a backlight for a display, wherein the three light sources are activated sequentially to emit the different color lights sequentially [par. (0055)].

Since the light source driving circuit of Yamazaki as modified by Okuda is also used as a backlight for a display [Yamazaki: pg 7 par. (0002)], it would have been obvious to one of

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ordinary skill in the art at the time of the invention to modify the light source section of Yamazaki as modified by Okuda to include three light sources emitting different color lights (i.e. red, green, and blue) and a light source driving circuit for each of the light sources and to activate the three light sources sequentially, in order to provide a color display not requiring color filters and thus to improve the color quality of the display.

Drawing 1 provided above shows the light source driving circuit of Yamazaki as modified above.

As shown on drawing 1 provided above, Yamazaki as modified by Okuda and Sekine teaches that the charging section [drawing 1 above] includes a first driving capacitor [drawing 1 above, “104” for red light source driving circuit] corresponding to the first light source, a second driving capacitor [drawing 1 above, “104” for green light source driving circuit] corresponding to the second light source, and the third driving capacitor [drawing 1 above, “104” for blue light source driving circuit] corresponding to the third light source.

As to **claim 13**, Yamazaki as modified by Okuda and Sekine teaches that the switching section [drawing 1 above] includes a first switch [drawings 1 and 2 above, “201” for red light source driving circuit], a second switch [drawings 1 and 2 above, “201” for green light source driving circuit], a third switch [drawings 1 and 2 above, “201” for blue light source driving circuit], a fourth switch [drawings 1 and 2 above, “202” for red light source driving circuit], a fifth switch [drawings 1 and 2 above, “202” for green light source driving circuit], and a sixth switch [drawings 1 and 2 above, “202” for blue light source driving circuit], and that the power supply section is connected to the first driving capacitor via the first switch, the power supply section is connected to the second driving capacitor via the second switch, the power supply

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section is connected to the third driving capacitor via the third switch, the first light source is connected to the first driving capacitor via the fourth switch, the second light source is connected to the second driving capacitor via the fifth switch, and the third light source is connected to the third driving capacitor via the sixth switch.

As to **claim 14**, Yamazaki as modified by Okuda and Sekine teaches that the first switch, the second switch, the third switch, the fourth switch, the fifth switch, and the sixth switch each have a control terminal [drawing 2 above, each of the gates of "201" and "202"] and the first switch, the second switch, the third switch, the fourth switch, the fifth switch, and the sixth switch are controlled so as to conduct cyclically and in an alternating drive by a control signal that the control section applies the each control terminal (Note that Yamazaki teaches the concept of activating the light source section by supplying the control signal to the switching section and Sekine teaches the concept of activating a plurality of light source sections sequentially. Thus, Yamazaki as modified by Sekine teaches the concept of activating the plurality of light source sections sequentially by supplying the control signal to the switching sections sequentially.).

As to **claim 15**, Yamazaki as modified by Okuda and Sekine teaches that the power supply section includes a constant-current circuit [Okuda: fig. 10, "3"] and the power supply section charges the first driving capacitor, the second driving capacitor, and the third driving capacitor via the constant-current circuit (Note that, in the light source driving circuit of Yamazaki as modified by Okuda, a constant-current circuit is placed between the light source section and the voltage source and thus the capacitors are charged via the constant-current circuits.).

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As to **claim 16**, Yamazaki as modified by Okuda and Sekine teaches a lighting apparatus using the light source driving circuit [Yamazaki: pg 18 the last two lines].

As to **claim 17**, Yamazaki as modified by Okuda and Sekine teaches a display apparatus using the light source driving circuit [Yamazaki: pg 18 the last two lines].

As to **claim 18**, Yamazaki as modified by Okuda and Sekine teaches a field sequential color liquid crystal display apparatus using the light source driving circuit [Yamazaki: pg 18 the last two lines and Sekine: par. (0004) lines 1-4].

As to **claim 19**, Yamazaki as modified by Okuda and Sekine teaches an information appliance using the light source driving circuit [Yamazaki: pg 18 claims 14 and 15].

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEOKYUN MOON whose telephone number is (571)272-5552.

The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on 572-272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

December 6, 2010
/Seokyun Moon/
Examiner, Art Unit 2629